FEDERAL-STATE

COOPERATIVE SNOW SURVEYS and IRRIGATION WATER FORECASTS

for

MONTANA

March 1,1949

by

Montana Agricultural Experiment Station
and
Division of Irrigation, Soil Conservation Service
United States Department of Agriculture

in cooperation with

U.S.Forest Service •••• U.S.National Park Service •••• U.S.Bureau of Reclamation •••• U.S.Geological Survey
and State Engineer of Montana

FEDERAL-STATE COOPERATIVE
SNOW SURVEY AND IRRIGATION WATER FORECASTS

FOR

MONTANA
Upper Missouri and Upper Columbia Rivers

Report Prepared
by
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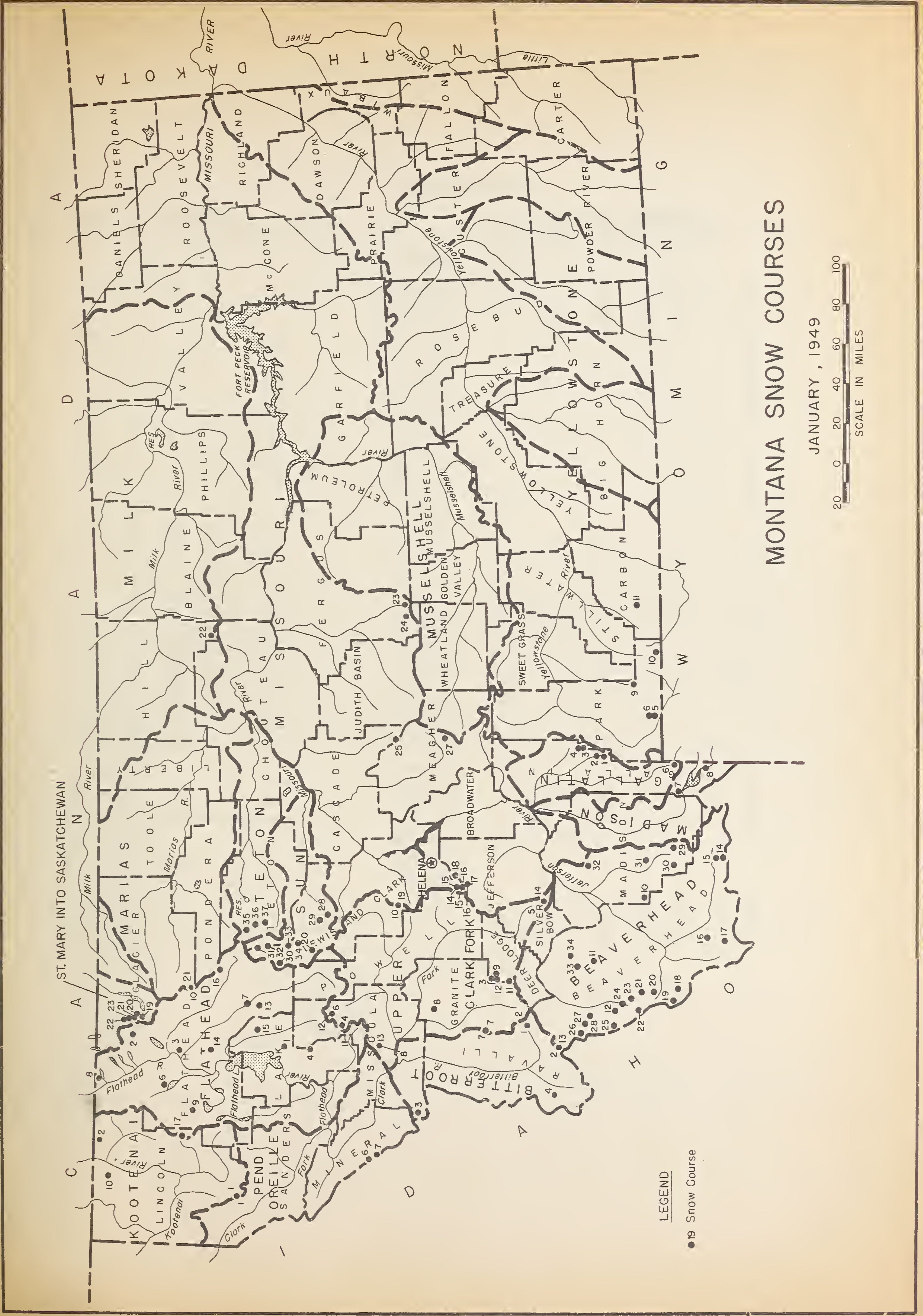
Soil Conservation Service

Division of Irrigation
Soil Conservation Service

and

Montana Agricultural Experimental Station
Bozeman, Montana



MONTANA SNOW COURSES

JANUARY, 1949

INDEX TO MONTANA SNOW COURSES

Name	Montana No.	Elev.	Location Sec. / Lat.	Twp.	Range / Long.	Record Began	Measuring Dates[a]	Measured By[b]
MISSOURI RIVER DRAINAGE								
JEFFERSON RIVER								
White Pine Ridge	15	8850	18	14S	9W	1948	3,4	1
Limekiln	17	6950	5	15S	9W	1948	3,4	1
Lakeview Ridge	14	7400	27	14S	2W	1948	3,4,5	9
Lakeview Canyon	15	6930	26	14S	2W	1948	3,4,5	9
Trail Creek	18	7090	15	10S	15W	1948	3,4	1
Lemhi Pass	19	7480	9	10S	15W	1948	3,4	1
Terrell Creek	20	6650	14	9S	15W	1948	3,4	1
Selway Junction	21	6800	27	8S	15W	1948	3,4	1
[illegible] Stone	22	8100	11	8S	16W	1948	3,4	1
[illegible] Dick	23	7600	12	8S	16W	1948	3,4	1
Jahnke Creek	24	7340	25	7S	15W	1948	3,4	1
Miner Forks	25	7300	24	6S	17W	1948	3,4	1
Miner Lake	12	6720	10	6S	16W	1945	3,4,5	1
Big Hole Pass	26	7440	28	3S	18W	1948	3,4	1
Below Big Hole Pass	27	6900	24	3S	18W	1948	3,4	1
East Boundary	28	6700	22	3S	17W	1948	3,4	1
Gibbons Pass	13	7100	4	2S	19W	1934	2,3,4,5	1,2
Elk Horn	11	8450	15	4S	12W	1934	3,4,5	2
Anderson Meadow	33	7000	18	3S	12W	1940	3,4	1
Wise River	34	6300	15	2S	12W	1948	3,4	1
Upper Cottonwood	29	[illegible]	3	10S	2W	1948	3,4	1
Cottonwood	[illegible]	5300	25	10S	3W	1948	3,4	1
[illegible]	31	6125	28	9S	3W	1948	3,4	1
Flashlight	10	6950	22	8S	7W	1945	3,4,5	1
Tobacco Root	32	6900	18	4S	3W	1948	3,4	1
MADISON RIVER								
[illegible]	[illegible]	6550	22	11S	3E	1934	1,2,3,4,5	2
West Yellowstone	8	6700	34&35	13S	5E	1934	1,2,3,4,5	2
GALLATIN RIVER								
Devil's Slide	1	8100	14	5S	6E	1935	3,4,5	2,6
[illegible] Meadow Extension	2	6600	22	4S	6E	1934	3,4,5	2,6
Mystic Lake #1 & #2	3	6600	30	3S	7E	1935	1,2,3,4	6,7
New World Trail	4	6700	24	3S	6E	1939	3,4	6,7
[illegible] Mile	6	7150	1	11S	5E	1934	2,3,4,5	2
YELLOWSTONE RIVER								
[illegible] #1	5	8400	29	9S	9E	1935	3,4	1
[illegible] #2	6	[illegible]	26	9S	9E	1935	3,4	1
Independence	[illegible]	7000	22	7S	12E	1940	3,4	6
[illegible]	[illegible]	7400	25	9S	14E	1937	1,2,3,4,5	5
[illegible]	11	[illegible]	2	8S	18E	1938	3,4	1
MUSSELSHELL RIVER								
[illegible]	17	[illegible]	19	9N	8E	1936	3,4	1,6
MISSOURI RIVER MAIN STEM								
[illegible]	14	[illegible]	11	1N	7W	1938	2,3,4,5	1
Tenmile Creek, Lower	15	[illegible]	13	8N	6W	1935	1,2,3,4,5	2
Tenmile Creek, Middle	16	6800	13	8N	6W	1934	1,2,3,4,5	2
Tenmile Creek, Upper	[illegible]	8000	19	8N	6W	1935	1,2,3,4,5	2
Chessman Reservoir	18	6200	2	8N	5W	1936	1,2,3,4,5	2
Stemple Pass	19	6900	16	13N	7W	1934	3,4,5	2
Crystal Lake	24	6100	24	12N	17E	1941	3,4	1,6
[illegible]	25	7950	35	13N	7E	1937	3,4,5	2
[illegible]	[illegible]	7000	19	9N	8E	1938	3,4	1,6
[illegible]								
[illegible]	[illegible]	[illegible]	21	[illegible]	12W	1949	3,4	1
[illegible]	[illegible]	[illegible]	17	25N	10W	1949	3,4	1
[illegible]	[illegible]	5700	32	25N	10W	1949	3,4	1
[illegible] Park	[illegible]	5300	31	24N	10W	1949	[illegible]	1
[illegible]	[illegible]	5400	33	23N	[illegible]	1949	3,4	1
[illegible]	[illegible]	[illegible]	36	20N	10W	1948	[illegible]	1
[illegible]	[illegible]	[illegible]	9	20N	10W	1948	[illegible]	1
[illegible]	[illegible]	[illegible]	21	22N	10W	1934	3,4	2
[illegible]								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1
[illegible]	36	[illegible]	6	25N	[illegible]	1948	[illegible]	1
[illegible]	[illegible]	[illegible]	16	25N	[illegible]	[illegible]	[illegible]	1
[illegible]								
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	1,2,3,4,5	2
[illegible]								
[illegible]	[illegible]	[illegible]	15	[illegible]	16E	[illegible]	3,4	6

Name	Montana No.	Elev.	Location Sec. / Lat.	Twp.	Range / Long.	Record Began	Measuring Dates[a]	Measured By[b]
COLUMBIA DRAINAGE								
KOOTENAI RIVER								
Baree Mountain	1	6000	1	25N	31W	1937	4,5	1
Bluebird Basin	2	6800	24	37N	26W	1937	4,5	1
Red Mountain	10	6000	4	36N	29W	1937	3,4,5	1
UPPER CLARK FORK								
Chessman Reservoir	1	6200	2	8N	5W	1936	1,2,3,4,5	2
East Fork Ranger Station	2	5400	16	2N	17W	1937	4	1
Intergaard	3	6450	6	5N	10W	1939	2,3,4	3
North Fork Jocko	4	6330	3	17N	17W	1941	3,4	4
Pipestone Pass	5	7200	11	1N	7W	1938	2,3,4,5	1
Rainy Lake	6	4300	11	18N	16W	1947	3,4,5	1
Skalkaho Summit	7	7258	30	6N	17W	1937	4,5	1
Slide Rock Mountain	8	7100	26	10N	16W	1937	4	1
Southern Cross	9	6500	9	5N	13W	1939	2,3,4	3
Stemple Pass	10	6500	16	13N	7W	1934	3,4,5	2
Storm Lake No. 2	11	7780	19	4N	13W	1939	4,5	1
Stuart Mill	12	6500	19	5N	13W	1939	2,3,4	3
Stuart Mountain #1	13	7400	6	14N	18W	1936	3,4,5	1
Tenmile Creek, Lower	14	6250	13	8N	6W	1935	1,2,3,4,5	2
Tenmile Creek, Middle	15	6800	13	8N	6W	1934	1,2,3,4,5	2
Tenmile Creek, Upper	16	8000	19	8N	5W	1935	1,2,3,4,5	2
BITTERROOT RIVER								
East Fork Ranger Station	1	5400	16	2N	17W	1937	4	1
Gibbons Pass	2	7100	4	2S	19W	1934	2,3,4,5	1,2
Mud Creek Pasture	3	4500	24	11N	24W	1937	2,3,4,5	1
Nezperce Camp	4	5560	19&20	1S	23W	1937	3,4	1
Skalkaho Summit	7	7258	30	6N	17W	1937	4,5	1
Stuart Mountain #1	8	7400	6	14N	18W	1936	3,4,5	1
FLATHEAD RIVER								
Big Creek	1	6750	6& 7	22N	18W	1941	4,5	4
Cattle Queen	2	4700	7	35N	17W	1939	3,4	5
Desert Mountain	3	5600	24	31N	19W	1937	4,5	1
Elk Mountain	4	5750	1	20N	19W	1941	3,4	4
Goat Mountain	5	7000	47°39'		112°54'	1944	3,4	2
Hell Roaring Creek Divide	6	5770	35	32N	22W	1942	4,5	1
Horse Ridge c	7	5200	8	25N	15W	1937	4,5	1
Kishenehn	8	4300	7	37N	21W	1946	4,5	5
Logan Creek	9	4300	34	30N	24W	1937	3,4	1
Marias Pass	10	5250	48°19'		113°21'	1934	1,2,3,4,5	2
North Fork Jocko	11	6330	3	17N	17W	1941	3,4,5	4
Rainy Lake	12	[illegible]	11	18N	[illegible]	1947	3,4,5	1
Spotted Bear Mountain	13	7000	23	25N	[illegible]	[illegible]	3,4	1
Strawberry Lake	14	6500	11	28N	19W	[illegible]	3,4	1
Trinkus Lake	15	6500	9	25N	17W	[illegible]	3,4	1
Snow Laboratory Station #13	16	5240	10	[illegible]	[illegible]	[illegible]	1,2,3,4,5	2
Brush Creek	[illegible]	[illegible]	13	[illegible]	[illegible]	[illegible]	3,4	[illegible]
PEND OREILLE RIVER								
Baree Mountain	1	6000	1	25N	31W	[illegible]	4,5	1
Freezeout Summit	6	7000	21	15N	[illegible]	[illegible]	3,4	1
Hoodoo Creek	7	6200	9&16	14N	[illegible]	[illegible]	3,4	1
SASKATCHEWAN RIVER DRAINAGE								
ST. MARY RIVER								
Piegan Pass #6	19	6500	48°45'		[illegible]	[illegible]	5	[illegible]
Piegan Pass #4	20	5000	48°46'		113°40'	[illegible]	5	[illegible]
Mount Allen	21	7000	48°44'		113°40'	[illegible]	5	[illegible],8
Ptarmigan #8	22	5800	48°50'		113°42'	[illegible]	5	[illegible]
Iceberg Lake	23	6000	48°50'		113°42'	[illegible]	[illegible]	[illegible]

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a. Numerals 1,2,3,4, and 5 refer to January 1, February 1, March 1, April 1, and May 1.

b. Numerals refer to agency that measures the snow survey, as follows:

1. U. S. Forest Service
2. U. S. Geological Survey and U. S. Engineer Corps
3. Montana Power Company
4. U. S. Indian Service
5. National Park Service
6. Montana Experiment Station
7. City of Bozeman
8. Dominion Water and Power Bureau
9. U. S. Fish and Wildlife Service

c. Discontinued 1943-1947

PRELIMINARY IRRIGATION WATER SUPPLY OUTLOOK
FOR MONTANA

March 1, 1949

The outlook for Irrigation water supply for the 1949 season is "EXCELLENT." Snow Survey measurements made on or close to March 1 indicate that there is approximately 130% of average water content in the snow packs for this season. This figure is relatively the same as last season. Reservoir storage is generally "GOOD."

The threat of FLOOD HAZARD from the plains are greatly reduced by virture of the reduced rate of melting during the last seven days of the month: A real FLOOD HAZARD exists over the Upper Columbia River Basin in Montana where an extremely heavy snow pack exists. Extremely warm temperatures with rainfall will, without a doubt, cause considerable damage.

Snow pack conditions in general indicate that there is a greater percentage of snow at low elevation courses than at high elevation courses. The low elevation courses (below 6500ft.) show approximately 140% to 180% of average water content while the high elevation courses (above 6500ft.) show from 125% to 130% of average water content which is indicative of an early spring runoff.

On the Milk River, the course at Rocky Boy indicated 86% of average which may indicate a slight shortage of snow in the lower reaches of the Basin. However, measurements made at Marias Pass at a high elevation indicate 153% of average.

The Jefferson, Madison and Gallatin Basins will produce a good supply of water and again the percentage is usually higher at the lower elevation than higher in the mountains.

The Main Stem of the Yellowstone River will supply approximately the same volume of water as last season; however, the timing of the peak flows will vary considerably by virtue of the high percentage of water content at low elevations. Snow measurements indicate about 10% greater volume this season than last year.

COLUMBIA RIVER

Snow Surveys on the Columbia River Basin indicate a greater percentage of snow at low elevations than at the higher stations which presents a greater hazard to flood conditions from warm temperatures accompanied by rain.

Precipitation reports from stations in the headwaters of the Clarks Fork River indicate a departure of +5.00 in. from normal. This added water will greatly increse the FLOOD HAZARD.

U.S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
STATE OF MONTANA, MONTHLY PRECIPITATION FOR
OCTOBER, 1948 - FEBRUARY 28, 1949

STATIONS	OCTOBER 1948		NOVEMBER 1948		DECEMBER 1948		JANUARY 1949		FEBRUARY 1949	
	Precip.	Dep.	Precip.	Dep.	Precip.	Dep.	Precip.	Dep.	Precip.	Dep.
WEST OF DIVIDE										
Butte	.36	-0.43	.41	0.00	0.94	.50	0.50	0.10	0.91	.49
Deer Lodge	.06	-0.62	.77	0.22	1.14	.63	0.53	-0.06	0.86	.43
Hamilton	.44	-0.47	1.53	0.72	1.32	.61	0.22	-0.55	1.57	.85
Kalispell	.40	-0.66	1.50	0.15	1.02	-.43	1.07	-0.50	1.28	.17
Missoula	0.23	-0.72	0.92	0.02	1.04	.09	0.34	-0.51	0.97	.17
CENTRAL DIVISION										
Babb	0.10	-1.08	0.44	-0.55	0.31	-.63	1.24	---	0.71	-.11
Dillon Normal School	0.15	-0.69	0.35	-0.45	0.95	.21	0.62	-0.21	0.57	-.25
Fort Benton	0.04	-0.68	0.70	0.11	0.63	.12	0.99	0.33	0.78	.29
Great Falls	.08	-0.78	0.39	-0.29	0.53	-.12	1.40	---	0.79	.24
Havre	.09	-0.58	-0.26	-0.35	0.52	-.09	0.44	-0.29	0.49	-.03
Helena WBO	.05	-0.56	0.61	0.16	0.80	.33	0.66	0.10	0.59	.22
Livingston	.21	-0.96	0.67	-0.13	0.88	.28	1.14	---	0.42	-.12
Lewistown Arpt.	.01	-0.35	1.02	0.81	---	---	---	---	---	---
Mystic Lake	.24	-1.60	1.13	-0.45	1.77	.73	1.40	---	1.69	.61
EASTERN DIVISION										
Billings#2	.01	-1.30	0.18	0.18	0.73	.23	1.46	0.83	0.48	.06
Circle	.06	-0.79	0.63	.06	0.45	-.30	0.57	---	0.31	-.30
Frazer	.03	-0.85	0.63	.10	0.95	.56	0.55	0.14	0.46	-.12
Malta	.00	-0.73	0.25	-.16	0.58	.12	0.16	-0.31	0.28	-.09
Mildred	T	-0.73	1.67	1.30	0.41	.09	0.98	0.64	0.41	.14
Medicine Lake	0.16	-0.59	1.15	0.82	0.48	.20	0.08	-0.23	0.14	-.18
Miles City	T	-0.90	0.49	-.08	0.31	-.32	0.85	0.19	---	---
Fort Peck	T	-0.75	0.14	-.33	0.16	-.12	0.16	---	0.23	-.04

NOTE: Departure from normal figures without a minus sign (-) are plus.

STORAGE IN RESERVOIRS OF MONTANA

MISSOURI RIVER BASIN AS OF FEBRUARY 28, 1949

RESERVOIR	Location or on Diversion from	Usable Capacity	Contents This Month End	Contents February 1948
Lake Sewall	Missouri	37,800	24,330	36,220
Hauser Lake	Missouri	52,090	32,730	45,730
Ft. Peck Res.	Missouri	19,000,000	12,580,000	13,200,000
Ruby Res.	Ruby	38,500		
Harrison Lake	Willow Cr.	17,760		
Hebgen Res.	Madison River	345,000	255,900	283,700
Madison Res.	Madison River	41,000	37,970	37,140
Smith River Res.	Smith River	10,700		
Gibbons Res.	N. Fk. Sun River	105,000	70,350	60,140
Willow Creek	N. Fk. Sun-Willow Cr.	32,300	18,470	16,700
Pishkun Res.	N. Fk. Sun River	32,000	16,140	20,840
Lower Two Medicine L.	Two Medicine River	14,000		
Four Horns Res.	Badger Creek	20,000	9,800	7,330
Birch Creek Res.	Birch Creek	30,000	28,380	19,030
Lake Francis Res.	Birch Creek	112,000	99,120	102,340
Ackley Lake	Judith River	5,820		4,690
Durand Res.	N. Fk. Musselshell	7,010		
Dead Man Basin	Musselshell River	52,500		
Martinsdale Res.	So. Fk. Musselshell	23,100		
Fresno Reservoir	Milk River	127,200		71,800
Nelson Res.	Milk River	66,800		
Mystic Lake	W. Rosebud Creek	20,800	9,360	10,980
Glacier Lake	Rock Creek	4,200		
Cooney Res.	Red Lodge Creek	27,500		7,410
Tongue Res.	Tongue River	73,900		9,580
Sherburne Lake Res.	Swiftcurrent Creek	66,100	11,580	34,240
Lake Helena	Missouri River	10,450	2,330	7,200
COLUMBIA RIVER BASIN				
Georgetown Lake	Flint Creek	31,000	28,210	28,660
E. Fk. Rock Cr. Res.	E. Fk. Rock Creek	16,040		
Nevada Creek Res.	Nevada Creek	12,600	9,140	
W. Fk. Bitterroot Res.	E. Fk. Bitterroot	31,700	10,000	10,000
Como Lake	Rock Creek	34,800		
Flathead Lake(Sommers)	Flathead River	1,791,000	651,600	681,200
Little Bitterroot	Little Bitterroot	37,100*	24,000	13,200
Dry Fork Res.	Dry Fork Creek	6,700*	2,240	2,240
Mission Valley Reservoirs	Mission Valley (Flathead River)	105,000**	28,891	39,720

*Comprise two Reservoirs on Dry Creek.

*Comprise two Reservoirs on Little Bitterroot River.

**Comprise nine small Reservoirs on Mission Valley Project Indian Reclamation Service.

MONTANA SNOW SURVEYS March 1, 1949

MISSOURI BASIN

SNOW MEASUREMENTS

DRAINAGE BASIN AND SNOW COURSE**	State	No.	Elev.	Date of Survey 1949	Snow Depth (In.) 1949	Water Content (Inches)							Years of Record
						March 1949	Past Records		Average Data*				
									March 1		April 1		
							1948	1947	Avg.	%Avg.	Avg.	%Avg.	
Jefferson River													
Anderson Meadow	Mont.	33	7000	2/15	36.2	8.4	6.6	---	---	---	---	---	2
Below Big Hole	"	27	6900	2/19	65.6	17.9	11.6	---	---	---	---	---	2
Big Hole Pass	"	26	7440	2/19	71.4	21.0	7.9	---	---	---	---	---	2
Bloody Dick	"	23	7600	2/21	47.2	14.0	7.0	---	---	---	---	---	2
Cottonwood	"	30	5900	2/25	31.4	8.2	5.9	---	---	---	---	---	2
Cottonwood, Upper	"	29	8400	2/25	35.4	9.2	6.0	---	---	---	---	---	2
East Boundary	"	28	6700	2/17	42.2	9.8	5.2	---	---	---	---	---	2
Elk Horn	"	11	8450	2/27	42.2	12.2	8.4	11.0	7.1	172	8.3	147	15
Flashlight	"	10	6950	3/1	23.8	5.1	3.8	3.4	3.4	150	5.4	95	4
Gibbons Pass	"	13	7100	2/28	81.2	26.2	13.8	25.5	17.4	170	20.8	126	15
Goldstone	"	22	8100	2/21	51.5	15.6	9.7	---	---	---	---	---	2
Jahnke Creek	"	24	7340	2/21	46.2	13.6	5.3	---	---	---	---	---	2
Lakeview Canyon	"	15	6930				4.2	---	---	---	---	---	2
Lakeview Ridge	"	14	7400				4.8	---	---	---	---	---	2
Lemhi Pass	"	19	7480	2/8	36.4	7.9	9.3	---	---	---	---	---	2
Limekiln	"	17	6950	2/7	13.3	2.6	0.8	---	---	---	---	---	2
Miner Forks	"	25	7300	2/22	46.5	14.0	6.3	---	---	---	---	---	2
Miner Lake	"	12	6720	2/22	38.9	9.4	6.6	10.4	7.7	129	9.0	103	4
Pipestone Pass	"	14	7200	3/2	29.3	6.8	5.7	5.7	4.0	170	5.4	126	11
Selway Junction	"	21	6800	2/9	35.2	8.8	4.1	---	---	---	---	---	2
Terrell Creek	"	20	6650	2/10	23.2	4.8	2.4	---	---	---	---	---	2
Tobacco Root	"	32	6900	2/24	39.8	11.0	8.3	---	---	---	---	---	2
Trail Creek	"	18	7090	2/8	32.0	7.0	7.8	---	---	---	---	---	2
Vigilante	"	31	6125	2/25	9.0	2.1	1.1	---	---	---	---	---	2
White Pine Ridge	"	16	8850	2/7	29.4	6.0	4.9	---	---	---	---	---	2
Wise River	"	34	6300	2/15	26.6	5.8	4.5	---	---	---	---	---	2
Camp Creek*	Idaho		6800	No Report			4.1	9.6	7.9		8.5		13

* Course on adjacent basin

** Location of course shown on Index Map

MONTANA SNOW SURVEYS March 1 , 1949

MISSOURI BASIN						SNOW MEASUREMENTS							
DRAINAGE BASIN AND SNOW COURSE **	State	No.	Elev.	Date of Survey 1949	Snow Depth (In.) 1949	Water Content (Inches)							Years of Record
									Average Data*				
						March	Past Records		March 1		April 1		
						1949	1948	1947	Avg.	%Avg.	Avg.	%Avg.	
Madison River													
Hebgen Lake	Mont.	7	6550	3/1	46.6	14.0	10.0	11.5	10.6	132	12.4	113	15
Norris Basin	"	7	7500	Not Surveyed			---	8.9	8.1	---	9.5	---	10
21 Mile	"	6	7150	2/28	60.9	20.5	10.5	10.1	12.9	159	15.5	132	15
West Yellowstone	"	8	6700	3/1	47.4	14.4	7.0	10.3	9.5	152	10.6	136	15
Valley View	Idaho		6500	No Report			8.8	13.4	11.2	---	14.0	---	3
Big Springs	"		6500	No Report			13.2	17.5	11.0	---	19.5	---	13
Gallatin River													
Devil's Slide	Mont.	1	8100	3/1	58.9	18.1	23.2	16.0	14.9	122	19.7	92	14
Hood Meadow Ext.	"	2	6600	3/1	34.1	8.7	11.3	6.2	6.2	140	8.2	106	15
Mystic Lake	"	3	6600	2/27	35.1	9.1	11.7	7.6	6.3	154	6.8	143	13
New World	"	4	6600	2/27	37.8	11.2	14.7	10.7	8.8	123	7.4	119	8
21 Mile	"	6	7150	2/28	60.9	20.5	10.5	16.1	12.9	159	15.5	132	15
Main Stem Above Great Falls													
Chessman	"	18	6200	2/28	26.9	7.1	8.4	6.0	4.2	169	4.4	161	13
Crystal Lake	"	24	6100	2/27	51.1	15.1	11.4	9.1	10.3	147	12.0	126	8
Grasshopper	"	27	7000	2/26	31.0	7.3	5.1	3.6	3.9	187	4.9	149	11
Kings Hill	"	25	7950	2/28	52.6	15.1	12.0	13.5	9.8	154	12.3	123	15
Picnic Grounds	"		6500	2/28	29.8	6.3	3.0	---	---	---	3.6	175	4
Pipestone Pass	"	14	7200	3/2	29.3	6.8	5.7	5.7	4.0	170	5.4	126	11
Rimini Lower	"	15	6250	3/1	33.0	8.1	9.0	9.1	5.2	156	5.9	137	14
Rimini Middle	"	16	6800	3/2	42.6	11.2	12.4	13.0	7.8	144	9.8	114	15
Rimini Upper	"	17	8000	3/2	45.6	13.2	15.7	16.3	10.1	131	12.7	104	15
Stemple Pass	"	16	6900	3/1	44.0	12.1	8.5	12.0	7.7	157	8.7	139	15

*Course on adjacent basin
**Location of course shown on Index Map

MONTANA SNOW SURVEYS March 1 , 1949

MISSOURI BASIN

SNOW MEASUREMENTS

DRAINAGE BASIN AND SNOW COURSE **	State	No.	Elev.	Date of Survey 1949	Snow Depth (In.) 1949	Water Content (Inches)								Years of Record
						March 1949	Past Records		Average Data					
									March 1		April 1			
							1948	1947	Avg.	%Avg.	Avg.	%Avg.		
Sun River														
Bench Mark	Mont.	29	5500	2/27	38.0	9.0	7.0	---	---	---	---	---		2
Cabin Creek	"	34	5400	2/26	26.3	6.2	---	---	---	---	---	---		1
5 Bull	"	28	5600	2/27	28.4	6.9	7.7	---	---	---	---	---		2
Gates Park	"	33	5300	2/27	27.4	9.9	---	---	---	---	---	---		1
Goat Mountain	"	20	7000	2/28	39.8	11.2	9.8	16.1	7.6	149	8.6	131		9
My Lake	"	30	7300	Not Surveyed			---	---	---	---	---	---		1
Wrong Creek	"	32	5700	2/28	50.0	14.5	---	---	---	---	---	---		1
Wrong Cr. Ridge	"	31	6800	3/2	62.6	20.9	---	---	---	---	---	---		1
Teton River														
Fright Creek	"	35	6000	3/1	49.9	15.3	12.3	---	---	---	---	---		2
Waldron Creek	"	37	5600	2/28	28.3	6.8	4.5	---	---	---	---	---		2
West Fork	"	36	6000	2/28	50.4	16.6	9.9	---	---	---	---	---		2
Marias River														
Marias Pass	"	21	5250	2/28	63.2	20.5	13.1	13.3	13.4	153	15.5	132		12
Rocky Boy	"	22	5200	3/1	24.9	4.4	6.5	4.1	5.1	86	5.6	79		7
Snow Lab. 13	"	16	5240	3/1	39.3	11.3	9.0	---	---	---	---	---		2
Milk River														
Rocky Boy	"	22	5200	3/1	24.9	4.4	6.5	4.7	5.1	86	5.6	79		7

** Location of course shown on Index Map

MONTANA SNOW SURVEYS March 1 , 1949

MISSOURI BASIN

DRAINAGE BASIN AND SNOW COURSE **	State	No.	Elev.	Date of Survey 1949	Snow Depth (In.) 1949	SNOW MEASUREMENTS Water Content (Inches)							Years of Record
						March	Past Records		Average Data				
									March 1		April 1		
						1949	1948	1947	Avg.	%Avg.	Avg.	%Avg.	
Yellowstone River													
Canyon	Wy.	2	7750	3/2	53.3	13.4	9.5	11.3	9.0	149	10.5	128	12
Crevice #1	Mont.	5	8400	2/28	43.2	11.4	11.2	8.8	7.9	144	9.9	119	10
Crevice #2	"	6	8150	2/28	43.7	11.4	11.8	9.5	8.5	139	9.6	123	9
Lake	Wy.	1	7850	3/2	43.2	12.5	9.2	9.5	8.5	147	10.3	121	13
Lupine	"	3	7300	2/28	43.4	13.3	7.5	8.0	8.4	158	9.9	135	6
Sylvan Pass	"	32	7100	3/1	49.7	15.7	12.6	10.8	12.2	124	13.1	120	6
Shields River													
Porcupine	Mont.	7	6500	2/28	30.6	8.0	5.2	4.1	3.8	210	4.0	200	11
Boulder River													
Independence	Mont.	9	8000	3/6	60.7	20.3	18.7	---	13.4	152	17.1	119	6
Clark Fork of Yellowstone													
Camp Senia	Mont.	11	7890	3/2	24.3	6.6	9.3	6.2	4.8	138	7.3	91	11
Cook City	"	10	7400	2/28	35.8	9.3	3.2	7.2	6.2	150	7.1	131	12

** Location of course shown on Index Map

MONTANA SNOW SURVEYS March 1, 1949

COLUMBIA BASIN

DRAINAGE BASIN AND SNOW COURSE **	State	No.	Elev.	Date of Survey 1949	Snow Depth (In.) 1949	SNOW MEASUREMENTS Water Content (inches) March 1949	Past Records 1948	Past Records 1947	Average Data March 1 Avg.	Average Data March 1 %Avg.	Average Data April 1 Avg.	Average Data April 1 %Avg.	Years of Record
Kootenai River													
Fernie	Canada		3500	2/28	37.3	9.3	8.1	10.6	6.8	135	6.7	137	9
Gray Creek	"		5100	2/26	65.7	17.8	---	---	---	---	---	---	1
Kimberley	"		3750	2/27	37.2	7.2	7.3	9.3	5.0	144	4.1	175	8
Marble Canyon	"		5000	2/28	49.0	12.0	11.8	13.1	---	---	---	---	2
Nelson	"		3050	2/28	61.8	20.2	13.3	14.6	11.2	182	11.7	173	8
Red Mountain	Mont.	10	6000	3/1	59.4	18.7	15.5	20.1	14.7	127	16.5	114	10
Sinclair Pass	Canada		4500	2/28	20.8	3.7	5.9	---	---	---	4.6	---	12
Sullivan Mine	"		5100	2/28	52.3	12.7	12.1	7.2	9.9	129	13.5	94	2
Upper Elk River	"		--	2/28	32.0	8.0	---	---	---	---	---	---	1
Upper Clark Fork													
Intergaard	Mont.	3	6450	2/28	39.5	10.6	8.3	6.6	5.5	192	7.3	145	10
North Fork Jocko	"	4	6330	3/2	100.0	37.4	39.5	44.1	38.7	118	37.5	136	7
Pipestone Pass	"	5	7200	3/2	29.3	6.8	5.1	5.1	4.0	170	5.4	126	11
Rainy Lake	"	6	4300	2/27	44.5	14.3	9.0	10.1	---	---	---	---	2
Southern Cross	"	9	6500	2/28	25.2	6.5	5.1	3.8	4.1	159	3.9	167	10
Stemple Pass	"	10	6900	3/1	44.0	12.1	3.5	12.0	7.7	157	8.7	139	15
Stuart Mill	"	12	6500	2/28	33.8	8.9	6.5	5.5	4.4	201	5.5	161	10
Stuart Mountain#1	"	13	7400	No Report			29.5	32.1	24.3		29.0		13
Tenmile Cr. Lower	"	14	6250	3/1	33.0	8.1	9.0	9.3	5.4	150	5.9	137	12
Tenmile Cr. Middle	"	15	6800	3/2	42.6	11.2	12.4	13.0	7.8	143	9.8	114	15
Tenmile Cr. Upper		16	8000	3/2	45.6	13.2	15.7	16.3	10.1	131	12.7	104	13
Bitterroot River													
Gibbons Pass	"	2	7100	2/28	81.2	26.2	19.8	25.5	17.4	150	20.8	126	15
Mud Creek Pasture	"	3	4500	3/1	47.8	15.4	4.7	7.2	6.7	240	5.1	301	5
Nezperce Camp	"	4	5800	No Report			12.0	15.8	10.1		12.0		12
Nezperce Pass	Idaho		6575	No Report			20 9	21.4	14.6		16.1		12
Packers Meadow	"		5700	2/28	85.3	30.7	16.4	21.4	16.9	182	19.1	161	12

**Location of course shown on Index Map

MONTANA SNOW SURVEYS March 1 , 1949

COLUMBIA BASIN

DRAINAGE BASIN AND SNOW COURSE **	State	No.	Elev.	Date of Survey 1949	Snow Depth (In.) 1949	SNOW MEASUREMENTS Water Content (Inches)							Years of Record
						March 1949	Past Records		Average Data				
									March 1		April 1		
							1948	1947	Avg.	%Avg.	Avg.	%Ave.	
Flathead River													
Cattle Queen	Mont.	2	4700	No Report			24.3	33.1	29.4		28.2		3
Elk Mountain	"	4	6750	No Report			---	---	16.0		20.1		5
Logan Creek	"	9	4300	3/2	41.0	10.0	---	---	---	---	7.2	138	10
Marias Pass	"	10	5250	2/28	63.2	20.5	13.7	13.3	13.4	153	15.5	132	12
North Fork Jocko	"	11	6330	3/2	100.0	37.4	39.5	44.8	30.7	118	27.5	136	7
Rainy Lake	"	12	4300	2/27	44.5	14.3	9.0	10.1	---	---	---	---	2
Spotted Bear Mt.	"	13	7000	3/1	53.0	19.0	20.5	---	---	---	---	---	2
Strawberry Lake	"	14	6500	3/3	101.0	39.0	---	---	---	---	---	---	1
Trinkus Lake	"	15	6500	2/28	102.0	37.0	32.2	---	---	---	---	---	2
Snow Lab. #13	"	16	5240	3/1	39.3	11.3	9.0	---	---	---	---	---	2
Brush Creek	"	17	5000	3/1	56.0	17.0	---	---	13.8	123	8.5	196	5
Trout Lake	"		6500	2/28	60.0	21.0	14.4	---	---	---	---	---	2
Limestone Pass	"		7000	No Report			---	---	---	---	---	---	
Upper Holland Lake			7000	2/24	95.0	31.0	27.8	---	---	---	---	---	2
Big Creek	"		6750	2/25	97.0	35.0	---	---	30.4	115	36.0	97	6
Pend Oreille River													
Baree Mountain	"	1	6000	No Report			---	---	---	---	35.5		10
Freezeout Summit	"	6	7000	"	"		---	---	---	---	28.8		12
Hoodoo Creek	"	7	6200	"	"		---	---	---	---	42.5		12
Lookout	Idaho		5250	"	"		---	33.9	28.3		29.4		23

**Location of course shown on Index Map